5.—Revision of the Egernia whitei species-group (Lacertilia, Scincidae)

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Abstract

The *Egernia whitei* species-group is confined to Tasmania and the southern two-thirds of Australia and consists of eight species: *margaretae* nov., *pulchra* Werner, *whitei* Lacépède, *multiscutata* Mitchell & Behrndt, *slateri* nov., *inornata* Rosén, *striata* Sternfeld and *kintorei* Stirling & Zietz. The first three species comprise the *E. whitei* superspecies. The last three species are monotypic; the others are divisible into two or three subspecies, including *margaretae personata* nov., *pulchra longicauda* Ford, *whitei modesta* nov., *whitei tenebrosa* Condon, *multiscutata bos* Storr and *slateri virgata* nov.

Introduction

One might question the validity of a species-group that embraces such diverse forms as *Egernia kintorei* and *E. pulchra longicauda*. Yet these taxa are connected by a chain whose adjacent links are so similar as to make it hard to devise keys and diagnoses for their separation. It is this continuity in adaptation and morphology that defines the species-group rather than any characters that all its components might share.

It is also due to this continuity that it has proved one of the most perplexing groups of Australian lizards. Earlier workers were hampered by paucity of material and lack of ecological data, two deficiencies that have been made abundantly good by recent field-work in the interior, notably by K. R. Slater and his colleagues at Alice Springs.

Nevertheless, even with 1,150 specimens before me, I have often failed to find really good diagnostic characters. As there is usually much overlap in scutation, proportions and meristics between related species, one must largely rely on differences in colour and pattern. This is unfortunate, for in several taxa coloration is subject to much individual or ontogenetic variation. Consequently it is feared that students with few and poorly preserved specimens will have trouble in identifying them. A brief preview of the species may be helpful.

Six of the eight species can be allotted to one or other of two sections:

(1) The *Egernia whitei* superspecies (comprising the semispecies *whitei, pulchra* and *margaretae)*. These are dark or drab lizards with relatively long flat heads, depressed bodies and slender appendages. They live among rocks or plant debris in the more humid parts of southeastern and southwestern Australia, with outlying populations in the mountains of northern South Australia and the south of the Northern Territory. As all these lizards are allopatric, they can at last resort be identified on geography.

(2) *E. inornata, striata* and *kintorei*. These are reddish or yellowish lizards with relatively short deep heads, deep bodies and short thick appendages. They live in complex burrow-systems in arid and semiarid regions. Because they are broadly sympatric they can only be identified on morphology. *E. inornata* should never be hard to distinguish from the other two. However the separation of *striata* and *kintorei* may require in some cases the simultaneous consideration of several characters.

The remaining species, *multiscutata* and *slateri*, variously combine the characters of the two sections. *E. multiscutata* could only be confused with members of the *whitei* superspecies with which it is partly sympatric. *E. slateri* could only be confused with *inornata* or *striata*, both of which occur throughout its restricted range.

In the following descriptions quantitative characters are expressed as ranges. Means are not given here, for they are of little value in diagnosis; they are more useful in providing a picture of intragroup trends and so are brought together in one place (Table 1). Relative length of appendages must be used with some caution in diagnosis, for it changes with growth. The limbs are relatively much longer in juveniles than adults. Therefore if the snout-vent length indicates that a specimen is adult, its relative length of foreleg and hindleg should be close to the lower limits given for that taxon. Relative length of tail, however, is usually greatest in young adults.

Among the characters studied are two that require explanation: "upper palpebrals" refer to the series of enlarged whitish scales along the free edge of the upper eyelids; "calli" are subdigital thickenings that are too obtuse to be called keels. Snout-vent length is often abbreviated to SVL.

During this revision I have studied all the material in the Western Australian Museum (WAM) and have borrowed most of the specimens in the collections of the Animal Industry Branch, Alice Springs (NTM), South Australian Museum (SAM), National Museum of Victoria (NM), Australian Museum, Sydney (AM), Queensland Museum (QM) and Queen Victoria Museum, Launceston (QVM). For these loans I am grateful respectively to Messrs K. R. Slater, F. J. Mitchell, J. McNally, H. G. Cogger, J. T. Wood and W. F. Ellis. I am also grateful to Dr Eric Pianka for the loan of specimens he collected in the southern interior of Western Australia, and to Lt-Cdr A. Y. Norris for the opportunity to examine the collection made by the British Joint Services Expedition (JSE) to Central Australia in early 1967. Finally I am indebted to Mr. K. R. Slater for data on the ecology and pupil-shape of the Northern Territory species.

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TABLE 1

Number of specimens (number with original tail in parentheses), mean snout-vent length (mm), mean length of appendages (as per cent SVL) and mean number of midbody scale-rows, lamellae under fourth toe, supraciliaries, upper palpebrals, upper labials and ear lobules.

	Number	SVL	Tail	Foreleg	Hindleg	Scale-rows	Lamellae	Supra-ciliaries	Palpeb-rals	Labials	Lobules
m. margaretae	17 (3)	95	181	25.7	35.3	35.6	22.4	8.1	11.2	8.0	3.6
m. personata	12 (8)	89	169	29.3	40.8	40.9	23.2	7.9	12.8	8.4	2.8
p. pulchra	26 (12)	89	168	28.0	38.6	36.4	25.2	7.5	11.5	7.2	3.1
p. longicauda	16 (6)	91	196	28.6	39.2	35.4	26.1	8.1	11.6	7.9	3.2
w. whitei	16 (9)	85	168	27.9	38.7	37.2	24.6	7.4	11.6	7.4	3.2
w. modesta	20 (10)	95	165	25.8	35.9	37.0	23.1	7.7	12.1	8.0	3.7
w. tenebrosa	262 (116)	71	150	27.0	37.8	35.2	21.3	6.9	10.5	7.4	3.3
m. multiscutata	8 (2)	67	160	32.6	45.7	42.7	24.0	7.1	9.9	8.0	3.7
m. bos	97 (40)	72	149	30.5	40.9	41.7	24.0	7.8	10.7	7.8	4.0
inornata	246 (83)	65	125	28.5	38.2	37.4	23.5	7.5	10.7	7.0	3.8
s. slateri	89 (30)	75	130	29.3	38.8	39.7	22.1	7.4	11.1	7.1	4.3
striata	288 (136)	86	128	28.0	36.2	41.1	21.0	8.4	12.5	7.1	4.8
kintorei	46 (20)	160	111	26.7	32.7	47.6	20.2	8.4	14.6	8.1	4.9

Key to species and subspecies

1a. Dorsal ground coloration generally dark and dull (olive, grey, brown, fawn or chestnut) usually patterned with black longitudinal stripes, lines or rows of blotches; most ventral surfaces pale grey (at least in alcohol); head and body depressed or deep; tail 1.1-2.2 times as long as head plus body 2

1b. Dorsal ground coloration generally pale and bright (yellowish, fawn or reddish), either completely lacking black markings or dotted with black; head and body deep; tail 0.9-1.5 times as long as head plus body 10

2a. Dorsal scales smooth 3

2b. Dorsal scales keeled 5

3a. Conspicuous black callus along free edge of subdigital lamellae; scales of soles and palms each with a prominent black tubercle 4

3b. Subdigital lamellae smooth or with one or two series of pale or dark brown longitudinal calli or keels; soles and palms smooth or with small white or dark tubercles 6

4a. Dorsally dark olive grey or brown (sometimes suffused with dull chestnut) with or without black spots which tend to align longitudinally; snout no more depressed than rest of head, edges straight in plan; midbody scale-rows 38 or fewer .... *margaretae margaretae*

4b. Dorsally pale olive grey or brown, with or without black longitudinal lines (remnants of laterodorsal stripes); snout strongly depressed, edges concave in plan; midbody scale-rows 38 or more .... *margaretae personata*

5a. Nasals in contact or narrowly separated; upper labials usually 8; tail 1.8-2.2 times SVL; venter suffused with orange in life .... *pulchra longicauda*

5b. Nasals widely or narrowly separated; upper labials usually 7; tail 1.6-1.8 times SVL .... *pulchra pulchra*

6a. Interparietal much narrower than frontal in adults (slightly narrower or as wide in juveniles); head and body slightly to moderately depressed; midbody scale-rows 30-42 7

6b. Interparietal slightly narrower or wider than frontal in adults (much wider in juveniles); head and body deep or slightly depressed; midbody scale-rows 38-46 9

7a. Conspicuous white streak along upper half of upper labials, posteriorly bordered below by black streak; black laterodorsal stripe ragged-edged when present; tail heavily stippled with black; scales of soles and palms with or without small dark tubercle .... *whitei whitei*

7b. Pale labial streak absent or obscure, posteriorly bordered or not by brown streak; usually only base of tail patterned; palms or soles with or without small white tubercles 8

8a. Adults unpatterned and usually more than 95 mm in SVL; nasals narrowly separated; proximal subdigital lamellae usually with high calli .... *whitei modesta*

8b. Adults usually less than 95 mm in SVL; adults (like juveniles) may lack pattern on back and sides, but usually have sharp-edged black laterodorsal stripe (enclosing a series of pale spots) and ocellate flanks; nasals usually widely or moderately separated; proximal subdigital lamellae smooth or with low calli .... *whitei tenebrosa*

9a. Broad black laterodorsal stripe enclosing two (sometimes one) series of pale spots or short lines; subdigital lamellae usually bicarinate *multiscutata* subspp.

9b. No broad black laterodorsal stripe enclosing pale spots; subdigital lamellae compressed, with an apical series of calli 11

10a. Sides (especially dorsolaterally) and often back spotted finely with black; orbits black; pupil circular or a little narrower than high; SVL less than 85 mm .... *inornata*

10b. Black pigment completely absent; pupil narrowly or broadly elliptical; SVL of adults more than 85 mm 12

11a. Dorsal pattern consisting of several black (or dark brown) broken longitudinal lines .... *slateri slateri*

11b. Dorsal pattern consisting of a black vertebral stripe, widely separated from a broken laterodorsal stripe .... *slateri virgata*

12a. SVL less than 120 mm; pupil much narrower than high; back reddish brown, longitudinally striped with dark reddish brown; ground coloration gradually becoming greyish brown on sides; upper labials usually 7; presuboculars usually 2; midbody scale-rows usually fewer than 46 .... *striata*

12b. SVL of adults more than 150 mm; pupil slightly narrower than high; back pale reddish brown with or without slightly darker longitudinal stripes; lateral coloration grey, sharply demarcated from dorsal; upper labials seldom fewer than 8; presuboculars seldom fewer than 3; midbody scale-rows seldom fewer than 46 .... *kintorei*

Egernia margaretae margaretae subsp. nov.

Holotype.—R 29129 in Western Australian Museum, formerly NTM 2351, an adult male collected by K. R. Slater and D. A. Lindner on 25 November 1964 at Palm Valley, Northern Territory, in 24°03'S, 132°42'E.

Diagnosis.—A large, dark, long-tailed, short-limbed member of the *E. whitei* superspecies, with head and body strongly depressed, colour pattern obscure or absent, and palms and soles tuberculate.

Distribution.—Central Australian highlands: James and George Gill Ranges of southern Northern Territory, and Musgrave and Mann Ranges of far northwestern South Australia.

Description.—Ear aperture narrow to moderately wide; lobules 3-5, usually obtuse, sometimes rectangular, rarely acute. Snout-vent length (mm): 53-107. Length of appendages (% SVL): foreleg 22-28, hindleg 31-38, tail 172-189.

Nasals moderately to widely separated. Prefrontals usually forming median suture, sometimes just touching or very narrowly separated. Frontal slightly to greatly wider than interparietal. Supraciliaries 8 (rarely 7 or 9). Upper palpebrals 10-12. Upper labials 8 (rarely 7 or 9). Midbody scales smooth, 34-38 rows. Lamellae under fourth toe 20-25, entire or proximally divided, each with a strong dark callus (becoming weaker distally and tubercular proximally). A dark tubercle in centre of each scale of palm and sole.

Dorsally olive brown, paler on tail and sometimes tending to reddish-brown on foreback. Black spots on back and tail, irregularly distributed or tending to align longitudinally. Sides greyish with black spots tending to form oblique rows directed up and back. Small black spots scattered on top and side of head. Sutures of chin-shields irregularly margined with black. Dark brownish grey spots or short wavy longitudinal lines on throat. In 30% of specimens black markings completely lacking.

Geographic variation.—The two specimens from South Australia have not been used in the above description. Their snout-vent length is 99 and 62 mm. They differ from northern specimens in the very narrow separation of nasals, wider interparietal (as wide as frontal in smaller specimen), fewer supraciliaries (6), more palpebrals (11 and 13), and fewer rows of midbody scales (32 and 36). The smaller has relatively long limbs (31 and 42% of SVL) and is patternless. The larger specimen's pattern merely consists of inconspicuous black spots suggesting the outline of a laterodorsal stripe. This population is separated from the Northern Territory populations by the arid Amadeus lowlands.

Remarks.—Named after Margaret Anne, wife of K. R. Slater, in appreciation of her hospitality. Mr. Slater kindly donated the holotype to the Western Australian Museum.

Paratypes.—Northern Territory: Palm Valley (NTM 2815-8), George Gill Range (NTM 1881-3, 2284-5, 2665-9, 2765-6, 2768-70). *South Australia:* Piltadi Rockhole (AM 17271), Erliwunyawunya Rockhole (AM 17456).

Egernia margaretae personata subsp. nov.

Holotype.—R 3748 in South Australian Museum, an adult collected by F. J. Mitchell on 26 October 1955 in Wilpena Gorge, South Australia.

Diagnosis.—A pale member of the *E. whitei* superspecies with very little pattern, narrow snout, long appendages, and strongly callose subdigital lamellae. Distinguished from *E. m. margaretae* by paler coloration and longer limbs.

Distribution.—Central and northern Flinders Range, South Australia.

Description. — Body moderately depressed. Snout strongly depressed and concave in plan. Ear aperture usually wide; lobules 2-4, usually obtuse and decreasing in size downwards. Snout-vent length (mm) : 57-107. Length of appendages (% SVL) : foreleg 27-32, hindleg 37-44, tail 157-177.

Nasals widely separated. Prefrontals forming a long median suture. Frontal much wider than interparietal. Supraciliaries 7-9. Upper palpebrals 11-14. Upper labials 8 or 9. Midbody scales smooth, striate, 38-43 rows. Lamellae beneath fourth toe 21-26, basally divided (rarely entire), each with a broad, high, dark callus (proximally merging with the black tubercles of soles).

Dorsal ground colour greyish or olive brown. Colour pattern greatly reduced; at most only edges remain of black laterodorsal stripe. Pale dorsolateral stripe usually discernible. Flanks obscurely flecked with whitish. Facial markings usually reduced to black orbital mask. Under surface greyish.

Paratypes.—South Australia: North Tusk, Gammon Range (SAM 8724-6), Balcanoona Creek (SAM 3934), Mern Merna (SAM 2645), Wilpena Pound (AM 16628-9), Wilpena Gorge (SAM 8503, 8717-8), 8 mi. SE of Warcowie (SAM 2573).

Egernia pulchra pulchra

Egernia pulchra Werner 1910, *in* Michaelsen & Hartmeyer's Fauna Südwest-Australiens 2: 470. Torbay, Western Australia.

Diagnosis.—The species *pulchra* is generally similar to *E. whitei* but differs from it and all other species of the group in having keeled dorsals.

Distribution.—The humid southwest corner of Western Australia from Nanga Brook south and east to Cheyne Beach; also in Stirling Range and on Eclipse Island.

Description.—Head and body moderately depressed. Ear aperture moderately wide or narrow; lobules 2-4 (mostly 3), acute or obtuse (sometimes squarish), sharply decreasing in size downwards. Snout-vent length (mm) : 47-107. Length of appendages (% SVL) : foreleg 25-32; hindleg 33-43; tail 159-181.

Nasals widely or narrowly separated. Prefrontals usually forming a long median suture (sometimes only moderately long, rarely short). Frontal much wider than interparietal in adults, a little wider in juveniles. Supraciliaries 6-8 (mostly 8). Upper palpebrals 10-13. Upper labials 7 or 8 (mostly 7). Midbody scales dorsally and laterally with 2-4 keels (moderately strong

in adults, very weak in juveniles); 34-39 rows. Lamellae under fourth toe 22-30, proximally divided.

Dorsal ground coloration fawn, becoming olive grey on head. A black laterodorsal stripe from nape to base of tail, enclosing a series of pale spots (grey or fawn) and bordered below by a pale grey dorsolateral stripe. Top of head and tail stippled with black. Orbit black, contrasting with creamy white edge of eyelids. Obscure black streak from orbit to temples. Sutures between upper labials margined with black. Sides of body grey, densely stippled with black and sometimes flecked with white. Under surface pale bluish grey.

Geographic variation.—Northern adults (4 from Darling Range and 4 from Stirling Range) have a longer hindleg (38-41, mean 39.9% of SVL) than 10 adults from the south coast (33-38, mean 37.5). In other respects these two widely separated northern populations diverge from the south-coast series in opposite directions, e.g. midbody scale rows and supraciliaries more numerous in the Darling Range, but less numerous in the Stirling Range, than on the south coast. The Darling Range population of *pulchra*, though nearest geographically to *longicauda*, goes hardly any of the way to bridging the morphological gap between the two subspecies.

Remarks.—Although *E. p. pulchra* lacks the conspicuous white labial streak and black facial streaks of *E. w. whitei*, it otherwise resembles it in coloration. This similarity is especially marked in less common variants, e.g. specimens with the black laterodorsal stripe broad and ragged-edged, or those described by Ford (1965) from the Stirling Range which have the back an unpatterned reddish-brown.

Material.—Western Australia (South-West Division): Nanga Brook (WAM 2563), Mt. William (WAM 16784-6), Denmark (WAM 266-8), 24954-8), Chorkerup (WAM 4517), Eclipse Island (WAM 6799, 6800), Two People Bay (WAM 16787-8), Cheyne Beach (WAM 16789-93), Bluff Knoll (WAM 21804, 22862), Mt. Toolbrunup (WAM 21801-2).

Egernia pulchra longicauda

Egernia pulchra longicauda Ford 1963, W. Aust. Nat. 9: 26. Favourite Island, Jurien Bay, Western Australia (J. R. Ford).

Diagnosis.—Differs from *E. p. pulchra* in having tail extremely long, nasals in contact or narrowly separated, and venter suffused with orange.

Distribution.—Islands of Jurien Bay, lower west coast of Western Australia.

Description.—Tail longest in genus. Ear aperture wide; lobules 3 or 4, large, usually obtuse, sometimes acute, usually decreasing in size downwards, suffused in life with orange. Snout-vent length (mm) : 54-104. Length of appendages (% SVL) : foreleg 26-31, hindleg 36-42, tail 180-218.

Nasals usually forming short median suture, occasionally narrowly separated or just touching. Prefrontals forming long median suture. Frontal much wider than interparietal. Supraciliaries 7-9 (mostly 8). Upper palpebrals 10-13. Upper labials 7-9 (mostly 8). Midbody scales dorsally and laterally with 2-4 keels; 33-38 rows. Lamellae under fourth toe 23-28 proximally divided.

Geographic variation.—All these skinks are fairly similar except for the two from Escape Island, which Ford collected 3-18 months later than the type series. The Escape Island specimens alone retain an orange suffusion over belly, labials and ear lobules. They have 9 upper labials (compared to 7 or 8 in type series) and 10 upper palpebrals (against 11-13). Their limbs are relatively a little shorter than in the skinks from other islands (neither has the tail intact). Both have the nasals separated, compared to only 2 out of 14 from elsewhere.

Remarks.—For ecological relationship of *longicauda* to the Jurien Bay populations of *E. bos* and *E. kingi*, see Ford (1963*a*, 1965); and for photograph of *longicauda*, Ford (1965).

Material.—Western Australia (South-West Division): Favourite Island (WAM 16769-72, 16781-3), Boullanger Island (WAM 16774-9), Whitlock Island (WAM 16780), Escape Island (WAM 17883-4).

Egernia whitei whitei

Scincus whitii Lacépède 1804, Ann. Mus. Paris 4: 192. New Holland.

Lygosoma moniligera Duméril & Bibron 1839, Erpétologie générale 5: 736. New Holland (Péron & Lesueur, Quoy & Gaimard).

Diagnosis.—The species *whitei* is generally similar to *E. pulchra* and *E. multiscutata* but differs from the first in having smooth dorsals and from the second in never having more than one series of pale spots enclosed by black laterodorsal stripe and by its smooth subdigital lamallae. The subspecies *whitei* is large and dark and differs from all others by raggedness of dorsal pattern (when present), black stippling throughout tail and prominent white subocular streak.

Distribution.—Coastal plains and hills of eastern New South Wales from Grafton south to a little beyond Sydney.

Description.—Head and body moderately depressed. Ear aperture wide; lobules 2-4 (mostly 3, seldom 2), obtuse or acute, decreasing in size downwards. Snout-vent length (mm) : 51-113. Length of appendages (%SVL) : foreleg 24-35, 33-46, tail 159-176.

Nasals usually widely, sometimes narrowly, separated. Prefrontals forming a moderate to long median suture. Frontal usually much wider, sometimes only a little wider, than interparietal. Supraciliaries 7-9 (mostly 7, seldom 9). Upper palpebrals 10-14. Upper labials 7 or 8 (seldom 6). Midbody scales smooth, 34-40 rows. Lamellae under fourth toe 22-27, entire or proximally divided. Palms and soles smooth or weakly tuberculate.

In adults and subadults, black laterodorsal stripe usually wider than in *E. w. tenebrosa*, ragged-edged and enclosing less regular white spots (which are sometimes very reduced in size and sometimes coalescing into lines). Sides of body stippled heavily with black and sparsely with white. Upper surface of tail stippled with black. Black facial streaks well developed, viz.

one from nostril back, immediately below eye, to top of ear aperture and a little beyond; another and higher, branching from first streak in front of eye and extending back to temples; and often a third, still higher, back from eye to side of neck. Prominent white subocular streak from below nostril back (or almost so) to lower half of ear aperture, posteriorly margined below by black streak along bottom of upper labials. Under surface greyish white, except on throat, which may have dark sutures between chinshields or scattered black blotches or greyish smudges.

Remarks.—The type of *whitei* was collected before the penetration of the Blue Mountains and probably came from Sydney, where John White resided between 1788 and 1793.

The syntypes of *moniligera* could have come from both Sydney and the Blue Mountains (Péron, for one, visited both). Duméril & Bibron's name (meaning necklace-bearing) is more apt for the Blue Mountains form than *adult* Sydney lizards. However, the animal whose measurements they give is far larger than any Blue Mountains specimen I have seen and almost certainly came from Sydney.

A specimen (NM 7864) said to come from Blackheath (Blue Mountains) is best identified with *E. w. whitei*. It has a snout-vent length of 97 mm and coloration very like that of the Kurnell specimen except that its white subocular streak is poorly developed. Blackheath is only 11 miles southeast of Hartley, from which there are long series of *E. w. tenebrosa*.

Material.—*New South Wales:* Grafton (NM 3458), Coast Range (NM 3459), Hunter River (NM 918), Sydney (NM 4174; NTM 2764, 2774), Randwick (AM 4038, 4040-1; NM 2760-1; WAM 14475), North Botany (AM 4170), Botany (AM 18487), Kurnell (NM 8885), Waterfall (AM 15123, 18772).

Egernia whitei modesta subsp. nov.

Holotype.—J 464 in Queensland Museum, an adult collected on 12 November 1912 at Chinchilla, Queensland.

Diagnosis.—A large, long-tailed, short-limbed subspecies of *E. whitei* in which adults have little or no colour pattern. Nasals narrowly separated. Tubercular calli on proximal subdigital lamellae.

Distribution.—Southeastern interior of Queensland north to Eidsvold and west nearly to St. George. Northeastern interior of New South Wales from Tenterfield south and west to Narrabri.

Description.—Head and body moderately depressed. Ear aperture moderately narrow to wide; lobules 2-5, acute or obtuse or serrate, usually decreasing in size downwards. Snout-vent length (mm): 44-112. Length of appendages (% SVL): foreleg 23-33, hindleg 33-43, tail 151-177.

Nasals narrowly separated, seldom touching. Prefrontals forming a short to long median suture, seldom separated. Frontal much wider than interparietal in adults, slightly wider in juveniles. Supraciliaries 7-9 (mostly 7 or 8). Upper palpebrals 10-14. Upper labials 7-9 (mostly 8). Midbody scales smooth; 33-40 rows. Lamellae under fourth toe 21-26, compressed, proximally divided and tuberculately callose, distally entire and smooth or weakly callose.

Only smallest juveniles have characteristic *whitei* pattern (back striped, sides ocellate). Pattern in large juveniles and subadults reduced or absent. Back and sides of adults uniformly olive; tail pale brown; under surface greyish white.

Paratypes.—*Queensland:* Eidsvold (AM 5314), Gayndah (AM 5535-6), Chinchilla (QM 13207-13), Greymare, near Thane (QM 13366), Thormby Station, E. of St. George (QM 3825). *New South Wales:* Tenterfield (AM 2894), Moree (AM 1824), Narrabri (AM 1059). *No locality:* AM 5014-6.

Egernia whitei tenebrosa

Egernia whitei tenebrosa Condon 1941, Rec. S. Aust. Mus. 7: 111. Flinders Chase, Kangaroo Island, South Australia.

Diagnosis.—A small, brownish subspecies of *E. whitei* which undergoes no ontogenetic change in coloration. Colour pattern (when present) more sharply defined than in other subspecies. No prominent white subocular streak. Tail usually unmarked.

Distribution.—Eastern interior of New South Wales: the Great Dividing Range and associated mountains from Point Lookout and the Warrumbungle Range south to the Monaro Tableland and Australian Alps, inland on western slopes to Mudgee and Cootamundra. Southern Victoria north to the Great Dividing Range; Lady Julia Percy Island. Bass Strait Islands: King Island, Kent Group and Furneaux Group (The Sisters, Flinders and Hummock Islands). Tasmania: northern and eastern lowlands and hills (up to 1200 feet) from Table Cape east to Gladstone and south to Hobart; islands off north coast (Three Hummocks, Waterhouse and Swan). South Australia: the southeast north to the Coorong and Penola; Mt. Lofty Range; Yorke Peninsula; Wedge Island; Kangaroo Island.

Description.—Head and body slightly depressed. Appendages moderately long in north, usually short in south. Ear aperture wide to moderately narrow; lobules 2-5, acute or obtuse, usually decreasing in size downwards. Snout-vent length (mm) 32-101 (90 seldom attained except in far north and on islands). Length of appendages (% SVL): foreleg 21-33, hindleg 30-48, tail 120-183.

Nasals widely or narowly separated. Prefrontals separated or forming median suture. Frontal usually much wider than interparietal in adults; slightly wider or slightly narrower in juveniles. Supraciliaries 5-9. Upper palpebrals 8-13. Upper labials 7-9. Midbody scales smooth (sometimes tristriate); 30-43 rows. Lamellae under forth toe 16-27, proximally divided and callose, distally entire and smooth or feebly callose. Palms and soles smooth.

Some individuals ("plain-back") have no dorsal pattern, and others ("patternless") neither dorsal nor lateral markings; but most have a bold clear-cut pattern of dorsal stripes

and lateral ocelli. Dorsal ground colour greyish brown to rufous brown, more olive on head, clearer and paler brown on tail. Broad, black, sharp-edged laterodorsal stripe enclosing single row of white spots (which anteriorly may coalesce). Pattern on flanks sharply demarcated from grey dorsolateral stripe and consisting of white, black-edged spots, which on side of shoulder form a short, white, black-edged bar (sometimes broken) extending from insertion of arm up to dorsolateral stripe. Tail usually unpatterned. Dark facial stripes not so well developed as in nominate race. Pale subocular streak obscure or absent. No dark labial streak. Under surface pale grey.

Geographic variation.—Wherever these skinks are abundant and more or less continuously distributed (as from the Blue Mountains south through Bass Strait to Tasmania) there is little variation in size and coloration, and scale counts and proportions only change gradually. Where the populations are isolated (as in the north and west) or restricted to small areas (as on Lady Julia Percy Island) there are apt to be large and unpredictable departures from normal, especially in size and coloration.

Generally body-size, relative length of appendages, scale counts and size of prefrontals decrease from north to south. But, as the following analyses show, clines terminate more often on the Victorian mainland than in Tasmania.

Maximum snout-vent length in most populations is 85-91 mm. In the lower north of New South Wales 96 is attained at Barrington Tops and 95 in the Mudgee district. Lady Julia Percy Island lizards are anomalously large (up to 97). However the largest *tenebrosa* I have seen is one from Upper Yarra with SVL 101, i.e. 11.5 mm more than any other specimen from the Victorian mainland.

The tail is relatively longest in New South Wales, population averages for adults varying between 160 and 170% of SVL. In South Australia (including Kangaroo Island) and Bass Strait it averages 150-160; in Victoria (including Lady Julia Percy Island) and Tasmania (including Waterhouse Island) 140-150. Relative length of foreleg in adults is greatest in the Warrumbungle and Mt Lofty Ranges (28-29%); on Kangaroo and the Bass Strait Islands it averages 27-28; in most of New South Wales 26-27, and in Victoria and Tasmania 25-26. Relative length of hindleg in adults averages 39-40% in the lower north of New South Wales, South Australia and Bass Strait Islands; 37-38 in southern New South Wales and on Lady Julia Percy and Kangaroo Islands, 36-37 in central New South Wales and Tasmania, and 35-36 on the Victorian mainland.

Midbody scale-rows average 41 in the Warrumbungles, 35-37 in the remainder of New South Wales, 34-36 in South Australia and on Lady Julia Percy Island, and 33-34 in Victoria, Bass Strait and Tasmania. Subdigital lamellae under fourth toe average 22-24 in the lower north of New South Wales, 22-23 in central and southern New South Wales and on Kangaroo Island, 21-22 on the South Australian mainland and Bass Strait Islands, 20-21 on Lady Julia Percy Island and Tasmania, and 19-20 on the Victorian mainland.

On Kangaroo Island counts of 8 upper labials are much more frequent than 7. In Tasmania and central and southern New South Wales counts of 8 are as frequent as 7, but in the remainder of the subspecies' range 7 is much more frequent than 8.

Palpebral counts average 12 in the Warrumbungles, about 11 in the remainder of New South Wales, between 10 and 11 in Bass Strait, Tasmania and South Australia and a little less than 10 in Victoria. Supraciliaries average between 7 and 8 in the lower north of New South Wales, about 7 in central and southern New South Wales and between 6 and 7 in the remaining populations.

No specimen from the lower north of New South Wales has the prefrontals separated. In central and southern New South Wales 5% of specimens have them separated, on the Victorian mainland 10%, South Australian mainland 15%, Kangaroo Island 17%, Lady Julia Percy Island (just off the Victorian coast) 24%, Bass Strait Islands 47%, Waterhouse Island (just off the north coast of Tasmania) 57%, and Tasmania 78%.

It now remains to mention some non-clinal variation. Populations from the lower north of New South Wales vary considerably in size, meristics and coloration, which indicates their isolation from each other. The three specimens from the Warrumbungles are the most distinctive. Their limbs are very long in contrast to the extremely short limbs of *E. w. modesta*, which occurs at Narrabri only 75 miles to the north. The largest of the Barrington Top series have a reddish suffusion on the foreback, which together with their large size and some development of dark tubercles on soles, suggests introgression from nominate *whitei*.

The skinks from Hartley in the Blue Mountains are generally very like those from southern New South Wales, Victoria and Tasmania. Their only peculiarity is the high number of ear lobules.

Kangaroo Island skinks are very variable in coloration. They are generally browner than elsewhere, and the variants "plainback" and "patternless" are moderately common. Almost all specimens have 8 upper labials.

The most distinctive population of *tenebrosa* is that occurring on Lady Julia Percy Island off the coast of western Victoria. As well as being large, many of these skinks have the tail and flanks stippled with black as in nominate *whitei*. Even the belly may be spotted. However most of the island colour variants, including "plainback" and "patternless", can be matched fairly well with odd specimens from the mainland of Victoria, especially the Grampians and their vicinity.

Material.—New South Wales: Point Lookout (AM 17136-8), Tubrabucca, Barrington Tops (AM 13344-9; NM 7833, 7922), Warrumbungle Range (AM 14970-2), Guntawang (AM 4044), Rylstone (AM 15358), Portland (AM 1555), Hartley (AM 1314-32, WAM 14474), Cootamundra (AM 792), Mt Kosciusko 3000 feet

(AM 5224-5), Bombala and Snowy Range (AM 4709, 5729-30, 11669). *Australian Capital Territory:* near Gasuk Gap (WAM 13369), no (AM 485-6, 492-9, 507-10, 5693, 5700), Berridale precise locality (AM 12497-9). *Victoria:* Buchan (NM 1671), Rosedale (NM 2499, 2500), Wilsons Promontory (NM 8112), Schnapper Point (NM 5898-9), Mordialloc (NM 4184), Upper Yarra (NM 1089), Mt Dandenong (NM 2896), Ringwood (NM 2878, 5563), Caulfield (NM 5494-5), Prahran (NM 1825), Coburg (NM 1047), Keilor (NM 2724-32, 5642-6), Sunbury (NM 951, 4170-3), Beaufort (NM 1612), Ararat (NM 2219), Stawell (NM 1233, 3457), Grampians including Mt William (NM 927, 2240-2; SAM 3194, 8567-8), Byaduk (NM 1507-10), Drumborg (NM 7927), Nelson (SAM 1146), Lady Julia Percy Island (AM 11750-1; NM5301-9, 8055-6, 10945-51; WAM 9885-7), no precise locality (NM 1191-2; AM 4126). *Bass Strait Islands:* King Island, including Narracoopa (AM 3658; NM 2145, 2626-7), Kent Group (NM 3454-6), West Sister Island (AM 12284). East Sister Island (AM 12282), Flinders Island including Emita and Killicrankie Bay (AM 12285, 14447; NM 11734-5; QVM a-b); Hummock or Prime Seal Island (NM 11748), "Bass Straits" (AM 4043). *Tasmania:* "Two Hummocks Island" (NM 13168-70), Waterhouse Island (QVM a-g), Swan Island (NM 30), Gladstone (QVM a-j), Nabowla (QVM a), Greens Beach (QVM a-c, SAM 6598), Launceston (AM 6757, QVM a-d), Trevallyn (QVM a-c), Cataract Gorge (QVM 1026), Tunbridge (QVM a-b), Lake Sinclair (SAM 8501), Freycinet Peninsula (WAM 28483-4), no precise locality (AM 2052, 5698-5706, 6759-61; NM 980, 2091, 2099; SAM 2895 a-c). *South Australia:* Penola (SAM 8560), South Coorong sandhills (SAM 2896, 8457), Tapanappa (SAM 2828), Basket Range (SAM 1649), Bulls Creek (SAM 7582), West Island, Encounter Bay (SAM 1696), Cape Jervis (SAM 7722-4), Yorke Peninsula (SAM 2897), Wedge Island (SAM 574, 5348, 8504). *Kangaroo Island:* Flinders Chase (SAM 2665), Ravine des Casoars (SAM 3278, 8475-7), American River (WAM 16794-7), Birchmore Lagoon (AM 7131), Deep Creek (AM 7153-4), no precise locality (SAM 794, 1185, 2904, 2907, 3478, 5926, 8456, 8458-67).

Egernia multiscutata multiscutata

Egernia whitii multiscutata Mitchell & Behrndt 1949, Rec. S. Aust. Mus 9: 176. Greenly Island, South Australia.

Diagnosis.—The species *multiscutata* is a small long-limbed member of the *E. whitei* species-group, most like *whitei* but differing in its much wider interparietal, bicarinate subdigital lamellae and laterodorsal stripe usually enclosing *two* series of pale spots.

Distribution.—Greenly Island, off southwest coast of Eyre Peninsula, South Australia.

Description.—Head and body slightly depressed. Ear aperture narrow to moderately wide; lobules 3 or 4, obtuse, subequal or slightly decreasing in size downwards. Snout-vent length (mm) : 50-88. Length of appendages (% SVL) : foreleg 30-34, hindleg 44-47, tail 152-168.

Nasals widely or narrowly separated, occasionally forming short median suture. Prefrontals forming a short to long median suture, sometimes narrowly separated. Frontal a little wider or narrower than interparietal in adults, much narrower in juveniles. Loreals 2, second usually a little lower than wide. Supraciliaries 6-8 (mostly 7). Upper palpebrals 8-11. Upper labials 8. Midbody scales smooth, 40-46 rows. Lamellae under fourth toe 22-26, with two widely separated series of keels.

Dorsal ground coloration dark brown or brownish grey. Black laterodorsal stripe (much broader than pale vertebral stripe) enclosing two series of pale spots or short longitudinal lines. Head olive grey or brown variegated with black. Tail dappled with black or dark brown. No pale dorsolateral stripe. Sides of body speckled heavily with black and sparsely with white. Chin-shields and posterior labials broadly margined with black or dark grey. Throat suffused with grey. Under digits dark horn-colour. Remainder of under surface pale bluish grey.

Remarks.—The species *E. multiscutata* undergoes hardly any more geographic variation than the subspecies *tenebrosa* of *E. whitei;* thus the propriety of subdividing it is not yet certain. The typical population happens to be the most distinctive in ecology, morphology and coloration.

Material.—*South Australia:* Greenly Island (type series—SAM 2636 a-e, 8579-81).

Egernia multiscutata bos

Egernia bos Storr 1960, W. Aust. Nat. 7: 99. Cheyne Beach, 32 mi. E of Albany, Western Australia.

Diagnosis.—Distinguished from *E. m. multiscutata* by paler coloration, presence of pale dorsolateral stripe, deeper head and body, and shorter limbs (especially hindleg).

Distribution.—Subhumid and semiarid sandplains and coastal dunes of southwestern and southern Australia. Western Australia from Bernier Island (Shark Bay) to Israelite Bay, inland to the Midland sandplains and Eastern Goldfields but excluding the wet southwest corner south of Lancelin and west of Cheyne Beach; Jurien Bay islands. South Australia: west coast of Eyre Peninsula, St. Francis Island, Thistle Island, Yorke Peninsula and Kangaroo Island.

Description.—Head and body usually deep. Ear aperture narrow (often slit-like); lobules 3-5 (mostly 4), usually obtuse (occasionally squarish or acute), usually subequal, sometimes decreasing slightly in size downwards. Snout-vent length (mm): 34-94. Length of appendages (% SVL): foreleg 24-35, hindleg 34-47, tail 126-179.

Nasals widely or moderately separated (seldom narrowly). Prefrontals forming a median suture (seldom narrowly separated). Frontal a little wider or narrower than interparietal in adults, much narrower in juveniles. Loreals 2, second usually a little higher than wide. Presuboculars usually 2, seldom 3. Supraciliaries 6-9 (mostly 8). Upper palpebrals 8-14. Upper labials 7-9 (mostly 8, seldom 9). Midbody scales smooth, 37-46 rows. Lamellae under fourth toe 21-27, usually bicarinate.

Dorsal ground coloration pale grey or brown, becoming olive on head. Black laterodorsal stripe usually present, no wider or not much wider than pale vertebral stripe, enclosing two (locally one) series of pale spots or short longitudinal lines. Pale dorsolateral stripe. Sides of body usually suffused (rarely marbled) with pale greyish brown (becoming blackish on scale sutures) and occasionally spotted with white. Black spots on tail usually arranged in transverse rows. Posterior labials narrowly margined with black. Chin-shields occasionally with narrow dark grey margins. Under digits pale horn-colour. Remainder of under surface pale bluish grey.

Geographic variation.—Like its distribution, variation in *bos* is generally disjunct rather than continuous. However, a few clines can be observed in Western Australia. From Bernier Island south through Jurien Bay and the Wheat Belt to the south coast, mean number of midbody scale-rows increases from 39.5 to 42.2, subdigital lamellae decrease from 25.5 to 23.2, relative length of tail decreases from 167 to 138% and hindleg from 43.4 to 39.7%.

The typical population (south coast sandplains from Cheyne Beach to Israelite Bay) is one of the most distinctive. These skinks are pale and short (SVL not greater than 82) and have an extremely deep head and body and high foreleg-hindleg ratio (78%).

In the central and southern Wheat Belt of Western Australia, coloration is darker and browner, the head and body not so deep, and the foreleg-hindleg ratio lower (73%). West coast skinks are generally similar, though larger and longer-tailed. In the southeastern interior of Western Australia (from Lake Varley northeast to Coonana) the black laterodorsal stripe is narrow and the outer series of pale spots usually lost.

Reduction of the laterodorsal stripe is carried much further in South Australia. In the single specimen from Mt. Wedge the outer series of pale spots is disappearing. Two of four specimens from Point Fowler have no laterodorsal stripe, and the single adult from Thistle Island is almost patternless.

The remaining South Australian populations are more normally coloured. Skinks from St. Francis Island are especially similar to typical *bos*. They are identical in coloration and habit but are a little larger (SVL up to 90) and have relatively longer appendages and more numerous midbody scale-rows, subdigital lamellae, upper labials, upper palpebrals and supraciliaries.

Material.—Western Australia: Shark Bay islands—Bernier (WAM 13118-9, 20498-20504); Jurien Bay islands—Sandland (WAM 16808-13), Favourite (WAM 16798-16800), Boullanger (WAM 16801-2), Essex (WAM 16803-7); South-West Division—Stockyard Gully (WAM 26746), Mt. Lesueur (WAM 22235-6), Lancelin Island (WAM 16814-20), 16 mi. W of York (WAM 16821), Boyagin (WAM 18546), 16 mi. E of Pingelly (WAM 16822-3), Corrigin (WAM 12646), Lake Varley (WAM 19241, 26177), Ongerup (WAM 2535), Toolbrunup (WAM 1384), Cheyne Beach (WAM 10752-4, 16824-38); Eastern Division—8 mi. W of Coonana (WAM 16843-4), between Queen Victoria Spring and Fraser Range (SAM 2900); Eucla Division—20 mi. N of Cape Arid (WAM 16839-40), 15 mi. SW of Israelite Bay (WAM 16841-2), Israelite Bay (WAM 17624-5). *South Australia:* Eyre Peninsula—Point Fowler (SAM 5761, 5765, 8498-9), St. Francis Island (SAM 2902-3, 2905-6, 8451-4, 8468-74), Mt. Wedge (SAM 5764), Elliston (SAM 5746), Fishery Bay (SAM 2549 a-b), Thistle Island (SAM 2547, 8582); Yorke Peninsula—Sweat Island (SAM 2901); Kangaroo Island—Birchmore Lagoon (AM 7129), no precise locality (SAM 8465).

Egernia inornata

Egernia inornata Rosén 1905, Ann. Mag. Nat. Hist. (7) 16: 139. "West Australia" (Holst).

Diagnosis:—A small member of the *Egernia whitei* group with moderately short snout, deep head and short tail; back yellowish or reddish brown, immaculate or spotted with black; spotting denser on sides and arranged in irregular vertical bars; spotting on top and sides of tail arranged in narrow transverse bars. Distinguished from *E. striata* and *kintorei* by presence of black pigment, and from *E. slateri* by absence of pale bluish-grey on ventral surfaces.

Distribution.—Arid and semiarid extratropical interior of Australia: Western Australia from Merlinleigh (100 mi. ENE of Carnarvon) and 40 mi. NW of Warburton Range south to the northeastern and eastern fringes of Wheat Belt (Jibberding, Wialki and 40 mi. E of Narembeen), Eastern Goldfields and southern edge of Great Victoria Desert; Northern Teritory north to the Ehrenberg Range, Haasts Bluff and Todd River Station; South Australia south to central Eyre Peninsula (Hambidge Reserve) and Murray Mallee; New South Wales at Nymagee in central west.

Description.—Body robust, not depressed. Ear aperture narrow, sometimes moderately wide; lobules 3-6 (mostly 4, seldom 5 or 6), white, usually small and obtuse, subequal or slightly decreasing in size downwards. Snout-vent length (mm): 32-84; smallest male with everted hemipenes 56. Length of appendages (%SVL): foreleg 24-35, hindleg 32-45, tail 108-148.

Nasals widely or narrowly separated, rarely touching or forming very short median suture; groove representing nasal-postnasal suture usually discernible. Second loreal usually a little higher than wide. Presuboculars 2, rarely 3; first occasionally fused to second loreal. Prefrontals usually forming a median suture, occasionally just touching or narrowly separated. Frontal a little wider or narrower than interparietal. Supraciliaries 5-9 (mostly 7 or 8). Upper palpebrals 9-14. Upper labials 7, rarely 6 or 8. Midbody scales smooth, 34-42 rows. Lamellae under fourth toe 19-28, proximally notched (occasionally entire or divided), usually with an apical series of weak or strong calli, sometimes smooth or bicallose.

Dorsally yellowish brown, fawn or coppery red, tending to olive grey or brown on head. Back immaculate or spotted with black; spots tending to be elongate and longitudinally

aligned. Upper lateral spots more numerous and conspicuous, longitudinally elongate but irregularly aligned into transverse bars slightly deflected forwards inferiorly. Caudal spots most prominent dorsolaterally, but usually enough on upper surface to form more or less continuous, narrow bands. Under surface pinkish or creamy white.

Geographic variation.—Dorsal coloration is more yellowish in southern semiarid habitats and more reddish in northern habitats. Geographic variation in meristics and proportions is small, unpredictable and local rather than clinal, which suggests some slight regional constriction in gene-flow.

Central Australian specimens have a shorter tail (119.9% of SVL) and hindleg (37.4) than average, and fewer subdigital lamellae (22.2) and upper palpebrals (10.1). Specimens from the Musgrave region, about 200 miles to the southwest, have a longer-than-average hindleg (38.2), fewer midbody scale-rows (36.6), and more subdigital lamellae (24.5) and upper palpebrals (11.4). A further 3-400 miles to the southwest, in the western parts of the Great Victoria Desert, the skinks are larger than average (they alone include specimens with SVL greater than 79 mm) and have a longer tail (132.2) and shorter-than-average foreleg (27.9).

Remarks.—The type of *inornata* was among a collection of nine species made by the Swedish geologist Dr N. Holst in 1896-7. There is only one area where all these nine species occur together, namely the Kalgoorlie-Leonora-Laverton region. The Lund Museum was unable to precise the locality of Holst's specimens or give me details of his itinerary except that "it appears from a letter . . . that he, for some time, visited Kalgoorlie".

Material. — *Western Australia:* North-West Division—Merlinleigh (WAM 8601); South-West Division—15 mi. E of Jibberding (WAM 28265), Wialki (WAM 16845), Merredin (WAM 1268), 40 mi. E of Narembeen (WAM 25992); Eastern Division—40 mi. NW of Warburton Range (WAM 14639-42), 30 mi. NW of Warburton Range (WAM 15144), Warburton Range (WAM 22104-6), Gahnda Rockhole (WAM 19977), Albion Downs (WAM 25066), 12 mi. N of Coolgardie (WAM 16846-7), Dedari (WAM 14120 a-c), 40 mi. NW of Cundeelee (WAM 13038), 12 mi. NW of Cundeelee (WAM 13041), Queen Victoria Spring (WAM 13028, 16849-52), 12 mi. S of Queen Victoria Spring (WAM 12243), near Lake Ell (WAM 16853-5), plus 57 specimens in Dr Pianka's collection from 17 mi. S of Atley, 5 mi. W of Lake Yeo Out-Station, 111 mi. W and 18 mi. S of Neale Junction, etc.; Eucla Division — Smithania Rock (WAM 25511). *Northern Territory:* Ehrenberg Range (JSE 364-5, 391), 30 mi. W of Haasts Bluff (AM 21110), Alice Springs District (AM 25794), Todd River Station (NTM 1448-52, 1465, 1503, 1528-35, 1890-6, 2536-51, 2553-4, 2557-74), Allambi Station (NTM 2552, 2555-6), Numery (NTM 2820), Deep Well (NTM 2636), Palmer Valley Station (NTM 1540), Curtin Spring (JSE 11, 39). *South Australia:* Musgrave Park (SAM 7209-66, 7681-5), Immarna (SAM 1024), Hambidge Reserve (SAM 8934), Yudnapinna (SAM 3041, 3057), Tinga Tingana (SAM 754), Tallaringa Well (SAM 5533), Mt. Burrell Station (SAM 294, 8421-9), Renmark (NTM 2755-6), Turners Well (SAM 22), Purnong (SAM 1024). *New South Wales:* Nymagee (AM 15331, 15334, 17894, 18476).

Egernia slateri slateri subsp. nov.

Holotype.—R 29130 in the Western Australian Museum, formerly NTM 2051, an adult male collected by D. A. Lindner and K. R. Slater on 3 September 1964 at Alice Springs, Northern Territory, in 23° 46′ S, 133° 53′ E.

Diagnosis.—A moderately small but robust member of the *E. whitei* group with short snout, deep head and greyish brown back spotted with dark brown or black. Intermediate in size and meristics between *E. striata* and *inornata* but distinguished from both those species by its pale bluish-grey venter and lack of reddish pigments. Further distinguished from *striata* by its much wider pupil and presence of black pigment and from *inornata* by its white-flecked lateral scales.

Distribution.—Alluvial plains in the valleys of the major Central Australian rivers (the Todd, upper Finke and upper Palmer) from Alice Springs southwest to Tempe Downs.

Description.—Body not depressed; ear aperture narrowly rectangular or elliptical; lobules 4-6 (mostly 4), white, usually obtuse (sometimes acute, especially superiorly), subequal or with lowest largest and second-lowest smallest. Snout-vent (mm) 38-93; smallest male with everted hemipenes 65. Length of appendages (% SVL); foreleg 24-34, hindleg 33-45, tail 113-144.

Nasals usually widely, sometimes narrowly, separated; groove representing nasal-postnasal suture usually faint. Prefrontals forming a long or short median suture, rarely separated. Frontal slightly wider than interparietal, seldom narrower. Loreals normally 2, second usually higher than wide. Presuboculars normally 2, first occasionally fused with second loreal. Supraciliaries 7 or 8 (rarely 6 or 9). Upper palpebrals 11-16. Upper labials usually 7, occasionally 8, rarely 6. Midbody scales smooth, striate, 37-44 rows. Lamellae under fourth toe 19-27, usually entire (sometimes basally notched, rarely divided), with a single apical series of dark, weak, obtuse keels (occasionally an additional series on basal lamellae).

Head iridescent olive grey-brown. Back greyish brown, many scales with outer third black or dark brown, the resultant spots forming more or less distinctly longitudinal stripes. Dorsolaterally and laterally, dark lateral edges of scales not so prominent as narrow whitish or pale brown posterior edge. Tail pale brown spotted with black and dark brown; spots irregularly shaped and tending to align longitudinally on upper surface and transversely on sides. Upper surface of limbs pale rufous brown with more or less distinct darker longitudinal stripes. Eyelids blackish except for creamy margin of free edges. Posterior upper labials (and sometimes posterior lower) more or less broadly margined with black or dark brown. Throat, chest and belly pale bluish; under limbs and girdles yellowish white.

Geographic variation.—All but one specimen come from two localities, Alice Springs and Hermannsburg. Though only 65 miles apart, these populations differ slightly in several characters. Hermannsburg skinks have longer limbs, fewer midbody scale-rows (38 slightly more frequent than 40, whereas 40 is considerably more frequent than 38 at Alice Springs) and fewer supraciliaries (7-9 with 8 more frequent than 7, against 6-8 with 7 overwhelmingly dominant at Alice Springs).

Remarks.—This skink is named after K. R. Slater who was first to demonstrate its morphological and ecological distinctiveness. Mr Slater kindly donated the holotype to the Western Australian Museum.

Paratypes.—Northern Territory: Alice Springs (NTM 2052-62, 2169, 2171, 2191-3, 2195, 2197-8, 2200, 2227-31, 2269, 2272-4, 2286-97, 2299, 2300, 2605, 2683-6, 2757, 2853, 2883), 5 mi. S of Alice Springs (WAM 24427-31), 10 mi. NE of Hermannsburg (NTM 2348-50, 2578, 2604, 2606, 2634), Tempe Downs (NTM 2771).

Egernia slateri virgata subsp. nov.

Holotype.—R 602 in South Australian Museum, an adult collected by S. A. White between Oodnadatta and the Everard Range, South Australia.

Diagnosis.—Distinguished from *E. s. slateri* by conspicuous black vertebral stripe.

Distribution.—Far northern South Australia.

Description.—Similar in habit to nominate *slateri*. Ear aperture narrow in adult, much wider in juvenile; lobules 4 or 5, obtuse. Snout-vent length of adult 94, of juvenile 50.

Nasals moderately separated. Prefrontals just touching or forming short suture. Frontal as wide as interparietal in juvenile, a little wider in adult. Loreals 2, second as high as wide or higher. Presuboculars 2. Supraciliaries 8 or 9. Upper palpebrals 12. Upper labials 7. Midbody scales smooth, 40 rows. Lamellae under fourth toe 22-24, slightly compressed, entire or basally divided, with an apical series of weak calli.

Prominent blackish vertebral stripe from occiput to at least base of tail. A broken blackish laterodorsal stripe. Sides with dark spots or short longitudinal bars, mixed (in juvenile) with small obscure whitish spots. Posterior labial sutures broadly or narrowly margined with black or dark brown. Under surface unmarked.

Remarks.—The exact provenance of the holotype is unknown. It was evidently collected by Capt. White in June or July 1914 during his trip to the Everard Range (White 1915) and is almost certainly one of the three specimens listed by Zietz (1915) under *"Egernia whitii"* as coming from Oodnadatta, Wantapella and the Musgrave Range. Only the second of these localities could be described as "between Oodnadatta, and the Everard Range." Wantapella is a lignum swamp 5 miles southwest of Granite Downs.

The paratype (D 273 in National Museum) is a juvenile collected by W. Baldwin Spencer. Though registered as "Central Australia, 1896" it may have been collected by the Horn Expedition. At any rate Lucas & Frost's description (1896 : 138) of three *"Egernia whitii"* from Oodnadatta and their fig. 3 (pl. XI) could only have been based on examples of *virgata*.

Egernia striata

Egernia striata Sternfeld 1919, Senckenbergiana 1: 79. Hermannsburg, Northern Territory (M. von Leonhardi).

Diagnosis.—A moderately large member of the *E. whitei* species-group with short deep head, vertically narrow pupil, short tail, strong limbs, and reddish-brown back with darker longitudinal stripes. Most like *E. kintorei* from which it can be distinguished by its unique pupil-shape, much smaller size, fewer midbody scale-rows and upper labials, lower second loreal and longer and sharper ear lobules. Distinguished from *E. inornata* and *E. slateri* by absence of black markings.

Distribution.—Arid zone of Australia: Western Australia from Woodstock (Pilbara) and Godfreys Tank (Great Sandy Desert) southeast to Laverton and Neale Junction (Great Victoria Desert); Northern Territory north to the Smoke Hills (Tanami Desert) and Tennant Creek; and far northwestern South Australia.

Description.—Body stout, not depressed. Head very short and wide but not quite so deep as in *E. kintorei*. Ear aperture usually narrow; lobules 3-6 (mostly 4 or 5, very rarely 3), obtusely or acutely triangular (rarely rectangular as in *kintorei*), subequal or slightly decreasing in size downwards. Snout-vent length (mm): 41-117; smallest male with everted hemipenes 82. Length of appendages (% SVL): foreleg 23-40, hindleg 29-47, tail 105-146.

Nasals widely separated (very rarely narrowly separated). Prefrontals usually forming a long median suture, seldom separated. Frontal a little wider or narrower than interparietal. Loreals normally 2, second 0.7-1.7 (1.1) times as high as wide. Presuboculars usually 2 (3 in only 9% of specimens). Supraciliaries 7-11 (usually 8 or 9, very rarely 11). Upper palpebrals 10-16. Upper labials 6-8 (mostly 7, very rarely 6), third-last occasionally precluded from orbit by enlarged palpebrals. Midbody scales smooth, 36-46 rows (seldom fewer than 38 or more than 44). Lamellae under fourth toe 17-25, proximally notched or divided; an apical series of weak and pale or strong and dark calli.

Back fawn or reddish-brown with obscure or pronounced longitudinal stripes caused by darkening of lateral edges of scales. Stripes extending forward to neck and backwards to base of tail, becoming broken on sides, finally disappearing or degenerating into more or less transverse rows of spots. Lateral ground coloration gradually changing from reddish brown to pale greyish-brown and finally greyish white (in contrast to *kintorei*, colour of flanks generally paler than back and not so sharply demarcated). Labials whitish, the posterior margined broadly with reddish or dark brown. Under surface white.

Geographic variation.—In this abundant and widespread skink geographic variation is slight, and only a little of it seems to be clinal. Ani-

mals from the northern half of the range (i.e. north of the Tropic) are a little larger than southern animals and have relatively shorter appendages. Maximum snout-vent length varies between 117 (Smoke Hills, N.T.) and 104 (Laverton, W.A.). Mean relative length of tail in adults varies between 117 and 125 in northern populations, against 119-129 in the south. The corresponding data for foreleg and hindleg are 25-26 (26-28) and 32-34 (34-37).

In the centre of the species' range, i.e. far northwest of South Australia, far east of Western Australia (Warburton Range) and southwest of the Northern Territory (Kintore Range), the frequency of specimens with frontal narrower than interparietal is about 10%; elsewhere it is about 50%. In the northeast (Tanami to Hermannsburg) the mean frequency of specimens with 3 suboculars is 22%, compared to only 4% in the remainder of the range.

Variation in all other scale characters is minor and local. Mean number of midbody scales varies from 39.4 in the Kintore Range (N.T.) to 42.3 at Laverton (W.A.); lamellae, 20.1 (Reedy Creek, N.T.) to 22.4 (Kintore Range); upper labials, 7.0 to 7.2; upper palpebrals, 11.6 (Laverton) to 14.2 (Hermannsburg); supraciliaries, 3.0 (Corandirk, N.T.) to 9.0 (Hermannsburg); and ear lobules 4.3 (Musgrave Park, S.A.) to 5.1 (Corandirk and Aileron, N.T.).

There is generally less geographic variation in colour than individual variation, though some populations could be classified as darker, redder and more strongly striped than others. The most distinctively coloured population is that from the far northeast (between Tennant Creek and Wauchope, N.T.). These skinks have only the vertebral and paravertebral stripes well developed; the remaining dorsal stripes are more or less broken.

The foregoing remarks and descriptions do not include a peculiar specimen (WAM 13027) from 60 miles east of Kalgoorlie, Western Australia. This skink is coloured exactly like *E. kintorei* (i.e. dorsum pale pinkish-brown, faintly striped; sides clear grey) but agrees with *E. striata* in its small size (SVL 100), low number of midbody scale-rows (41), low number of upper labials (7), and triangular ear lobules. A decision on the systematic position of this population (the only one of the *kintorei-striata* complex known to occur south of the "Mulga-Eucalypt Line") awaits the collection of more specimens and especially information on pupil-shape, ecology and maximum size.

Remarks.—Sternfeld's original description of *striata* is fairly complete, but he did not mention *inornata* or *kintorei*, let alone show how to distinguish *striata* from them. In 1924 he compared *striata* with *whitei* but not with either of its close relatives. It is little wonder then that Loveridge (1934) synonymised *striata* with *inornata*. Though Mitchell (1950) established the distinctness of *kintorei* from *inornata*, it remained for K. R. Slater (after studying the complex in the field) to rescue *striata* from oblivion.

Meanwhile Mertens (1922 : 174) had selected a lectotype from Sternfeld's 11 syntypes of *striata*. Recently Professor Mertens kindly sent me a photograph of this specimen, which has assured me that Sternfeld's name is correctly applied to the present taxon.

Material. — *Western Australia:* North-West Division; Woodstock (WAM 13088-9, 13455), Turee Creek (WAM 25136-7); Eastern Division—Godfrey's Tank, Canning Stock Route (WAM 4001, 4003), 178 mi. E. of Carnegie (WAM 28809-12), Warburton Range (WAM 15145, 17108-9, 17779, 22005, 22113, 22134, 22208-10, 24837), Nullye Rockhole, 110 mi. ENE of Cosmo Newbery (WAM 16856), 64 mi. ENE of Cosmo Newbery (WAM 28870), Kathleen Valley (WAM 27227), plus 76 specimens in Dr Pianka's collection from 10 mi. N of Millrose, 24 and 110 mi. ENE of Laverton, 80 mi. W and 16 mi. S of Neale Junction etc. *Northern Territory:* Smoke Hills, 30 mi. E of Tanami (NTM 2780-2), Tanami Desert Sanctuary between 20° 26′ and 20° 58′ S, in 130° 41′ E (NTM 2783-4), 20 mi. E of The Granites (WAM 25378-25404), Corandirk, *ca* 80 mi. SE of The Granites (NTM 2611, 2629, 2631, 2650-8), 15-38 mi. S of Tennant Creek (WAM 21459-61), Aileron (NTM 1399, 1424-6, 1441-5, 1453-4, 1884-9), 17 mi. SE of Aileron (WAM 24426), Hermannsburg (NTM 2357-8, 2397-2402, 2607, 2635), near Reedy Creek, George Gill Range (NTM 1921-3, 1992-7, 2347), plus 48 specimens in the collection of the British Combined Services Expedition from Mt Olga, Armstrong Creek, Shaw Creek, Bonython Range, Davenport Hills, Kintore Range and Willie Rockhole (23° 16′ S, 129° 45′ E). *South Australia:* Musgrave Park (SAM 7170-7203), Itari Rocks (SAM 7598-7604), Mt. Davies (SAM 5311, 8411-14).

Egernia kintorei

Egernia kintorei Stirling & Zietz 1893, Trans. Roy. Soc. S. Aust. 16: 171. Lectotype locality: 60 mi. S of Barrow Range, Western Australia, in 27° 01′ S, 126° 56′ E (Elder Expedition).

Egernia dahlii Boulenger 1896, Ann. Mag. Nat. Hist. (6) 18: 233. Roebuck Bay, Western Australia (K. Dahl).

Diagnosis.—An extremely large member of the *E. whitei* species-group with short thick appendages, short deep head, pale reddish-brown dorsum and grey sides. Most like *E. striata* from which it can be distinguished by its much greater size, more numerous midbody scales, labials, presuboculars and upper palpebrals, short rectangular ear lobules, and much wider pupil.

Distribution.—Great Sandy, Gibson and Great Victoria Deserts of Western Australia, and the Tanami Desert of Northern Territory.

Description.—Body stout, not depressed. Ear aperture narrow; lobules 4-6 (mostly 5), small, subequal, their free edge usually truncate and thus parallel to margin of aperture. Snout-vent length (mm): 75-206; smallest male with everted hemipenes 161. Length of appendages (% SVL): foreleg 23-33, hindleg 27-41, tail 92-130.

Nasals widely separated; groove representing nasal-postnasal suture usually discernible. Prefrontals forming a median suture (seldom separated). Frontal a little wider or narrower than interparietal. Loreals normally 2, second 1.5-2.2 times as high as wide except when transversely divided (10% of specimens). Presuboculars usually 3. Supraciliaries 7-10 (mostly 8 or 9). Upper palpebrals 12-17 (mostly 13 or 14). Upper labials 7-9 (mostly 8, rarely 7), third-last usually precluded from orbit by enlarged palpebrals. Midbody scales smooth in juveniles, dorsally striate or feebly tricarinate in adults; 43-52 rows. Lamellae under fourth toe 17-23, entire or proximally divided, smooth or weakly callose, sometimes fusing medianly.

Back pale reddish-brown with faint or moderately strong longitudinal stripes caused by darkening of lateral edges of scales. Sides grey, the colour tending to concentrate in broad indistinct vertical bars curving forwards inferiorly; bars separated by narrow zones in which odd scales are posteriorly edged with greyish white; sometimes grey is disposed as a coarse reticulum. Upper surface of limbs reddish-brown diffused with grey. Eyelids pale brown, their free edges margined with creamy white. Labials whitish, sometimes the posterior narrowly margined with pale brown. Under surface yellowish white.

Remarks.—In spite of its extreme size and northwestern locality, the type of *dahlii* undoubtedly belongs here, as Loveridge (1934: 337) suggested and Mitchell (1950:284) confirmed when designating a lectotype for *kintorei*.

Material.—Western Australia: Kimberley Division—Sturt Creek (WAM 4007-8); Eastern Division—near Godfrey's Tank, Canning Stock Route (WAM 4002, 4004-6), near Warburton Range (WAM 22117, 22177), Kathleen Valley (WAM 27228), 24 mi. ENE of Laverton (EP 10912), *Northern Territory:* Tanami Desert Sanctuary, 20° 12′-16′S, 130° 30′-59′E (NTM 2087-8, 2321, 2612, 2618-28, 2640-9), 20 mi. E of The Granites (WAM 28602-13).

Discussion

The most debatable part of the foregoing classification is the treatment of the *Egernia whitei* superspecies. I have been reluctant to combine all these more or less dark and depressed skinks into one species merely because they are allopatric. In many respects *E. whitei tenebrosa* is more like *E. multiscutata* than it is to *E. pulchra* and other members of the superspecies; yet *tenebrosa* and *multiscutata* are sympatric at Birchmore Lagoon, Kangaroo Island. Again, the differences between *whitei* and *margaretae* seem to be of a higher order than those between such sympatric species as *slateri* and *inornata* or *striata* and *kintorei*.

It is by no means certain that *whitei, tenebrosa* and *modesta* are only subspecifically distinct. I have combined them into a single semispecies because of their adjacent ranges and similarly coloured juveniles. However nominate *whitei* comes within 12 miles of the range of *tenebrosa* without showing intergradation. The southernmost locality of *modesta* is only 75 miles north of the range of *tenebrosa,* but very few of the sharp north-south clines observed in *tenebrosa* extend to *modesta.*

It is still more doubtful whether *personata* and *margaretae* are races of a single semispecies. Few of the marked differences between them could have been predicted from the difference in latitude of their ranges or from the closer proximity of *personata* to *whitei tenebrosa.* The principal characters that unite *margaretae* and *personata* (strongly callose digits, tuberculate pads and degeneration of colour pattern) could have evolved independently in response to similar environments (rocks in semiarid mountain ranges).

At present there are only two members of the *E. whitei* superspecies that are certainly conspecific, namely the two races of *E. pulchra.* Finality on the status of the other members of the superspecies awaits material from critical localities and will probably require the consideration of more characters than were studied in the present work.

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